

REMARKS

Claims 1-4, 8-21, 24-25, and 28-29 are pending in the application. Claims 1, 8, 19, and 24 have been amended. Claims 12-18 have been allowed.

Claim Rejections Under 35 U.S.C. §§ 102(b) and 103(a)

Claims 1-4 and 19-21 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,414,776 to Sims Jr. ("Sims"). Claims 8-11, 24, and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sims in view of U.S. Patent No. 4,201,107 to Barber, Jr. ("Barber"). Claim 28 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sims in view of Barber in further view of U.S. Patent No. 5,809,843 to Barger et al. ("Barger"). Claim 29 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sims in view of Barber in further view of U.S. Patent No. 4,524,667 to Duncan ("Duncan").

According to an embodiment of the present invention, an input signal is provided that includes an unwanted signal and an alternate signal is provided which includes a lower proportion of the unwanted signal. For example, a stereo (two channel, left-right) audio signal of a string quartet may inadvertently have, in one channel, an offending hum for a short period of time. To improve the signal in the problem channel, first and second processors process the two channels for a frequency band selected, which may be as small as possible, but to include the offending hum, so that (1) the selected frequency band is reduced (band-rejected) in the problematic channel, (2) a new signal containing only the selected frequency (band-passed) is derived from the non-problem channel, and (3) this newly derived signal is

added to (mixed with) the altered signal from the problem channel in a proportion so that the effect is essentially a replacement in the problem channel of the original signal-plus-hum by a similar signal, but without the hum.

The claims as filed state that the processing is done on a "selected frequency band" of the first and alternate signals. It was intended that this term would be interpreted with its general understanding in the art - a subset of the complete frequency spectrum of a signal. Applicants have amended claims 1, 8, 19, and 24 to bring out this feature to state that the "selected frequency band is less than a full frequency spectrum of said first and alternate signals." Features of these claims are wholly missing from the Sims reference.

The claims 4 and 21 as filed state separately adjusting "...selected frequency bands...for the first and alternate signals". This term should be understood as a frequency adjustment, rather than an amplitude adjustment of a frequency band. The feature of these claims is wholly missing from the Sims reference.

Sims describes a situation where there are many (at least two) sound sources (Note that the field of the invention concerns "...systems employing multiple microphones, as might be found in conference rooms, churches, auditoriums, and the like..."). Throughout Sims, these microphones are used for voices, and the goal is to stop the system from amplifying the signal from any microphone that is not being spoken into, so as to not amplify room noise and create speaker-to-microphone feedback. Each microphone is identified with a separate sound source, and the system is designed to turn on those microphones that are active (the microphones of people who are speaking), and to turn off those microphones that are inactive (the microphones of people who are not speaking).

Sims is concerned with generating an output signal from a plurality of microphones.

As shown at Col. 4, lines 1- 14, the levels for attenuators 13 and 17 are selected so that the channel signal for an active channel is substantially greater than that for an inactive channel.

As shown at Col. 4, lines 57-65, a threshold is set to control when one of the microphones is made active over a currently active microphone.

The simplest example of the present invention involves a single desired sound source (regardless of the number of microphones used to transduce the sound), and is generally described as such (note that a single sound source could comprise a single guitar, or a group of musical instruments, such as a string quartet). The field of Sims' invention is "...an audio mixing system for combining a plurality of input signals..." Col. 3, lines 5-6. If there is only one sound source, the Sims' system, and also the prior art mentioned in Sims, becomes superfluous. Nothing in Sims implies the replacement of part of one sound with another, and there is no motivation to do so under the field of his invention.

Each of the pending claims includes language concerning the adjustment of a level for a selected frequency band for a first and alternate signal. Sims makes no use of any frequency band in the treatment of the sound sources. Instead Sims seeks to mute an entire signal from an inactive microphone and allow the full spectrum signal to pass through for every active microphone. Though Sims does mention a speech filter (element 105) and low pass filter (element 107), these processors are used to process the signal input to a microphone without regard to the other microphones, and in any case are used only in the creation of a control signal: they have no effect whatsoever on the frequency spectrum of Sims' audio signal paths. That is, neither of these filters has any effect on the signals P1, P2, A1, or A2, (Fig. 1) except to derive the control signal which attenuates P1 to A1 and P2 to A2. In the presently claimed invention, the processors work to adjust the level in one frequency band, such that an increase in the one

of the first and alternate signals results in a decrease in level in the other of the first and alternate signals, specifically affecting the quality of the sound signals. There is no disclosure in Sims that this results in a corresponding increase in these frequency bands in the signal from the other microphone. Moreover, each of the claims talks of a signal, which contains an unwanted portion, present (though in different proportions) in each of the first and alternate signals. Sims does not describe that sound input into a first microphone is desired to be input into any other microphone.

Since basic features of each of the claims are missing from Sims, reconsideration and withdrawal of the rejection of claims 1-4 and 19-21 under 35 U.S.C. § 102(b) is respectfully requested.

With respect to the rejection of the remaining rejected claims under 35 U.S.C. § 103(a), the Barber, Barger, and Duncan references fail to make up for the deficiencies of Sims. It seems that these references have been cited to show the features of some of the dependent claims. It also appears that these references have not been cited because they show or suggest the main features of the independent claims. Applicants contend that there are several features of the dependent claims that are not shown or suggested by any of the cited references. Since features of claims 1, 8, 19, and 24 are not shown or suggested by the cited references, reconsideration and withdrawal of the rejection of claims 8-11, 24-25 and 28-29 under 35 U.S.C. § 103(a) is respectfully requested.

CONCLUSION

For all the above reasons, the Applicant respectfully submits that this application is in condition for allowance. A Notice of Allowance is earnestly solicited.


The Examiner is invited to contact the undersigned at (408) 975-7500 to discuss any

matter concerning this application. The Office is hereby authorized to charge any additional fees or credit any overpayments under 37 C.F.R. § 1.16 or § 1.17 to Deposit Account No. 11-0600.

Respectfully submitted,
KENYON & KENYON

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By: _____


Shawn W. O'Dowd
Reg. No. 34,687

KENYON & KENYON
333 West San Carlos St.
San Jose, CA 95110
(408) 975-7500 telephone
(408) 975-7501 facsimile

Marked up copy of the amended claims:

1. (Amended) A method of modifying a signal comprising:
Providing a first signal which includes an unwanted signal;
Providing an alternate signal which includes a lower proportion of said unwanted signal;
Supplying said first and alternate signals to first and second signal processors, respectively;
Adjusting a level for a selected frequency band of said first signal and said alternate signal with said respective first and second processors, where said selected frequency band is less than a full frequency spectrum of said first and alternate signals, such that an increase of level in one of said first and alternate signals results in a decrease in level in the other of said first and alternate signals; and
Combining said first and alternate signals after said adjusting step.
8. (Amended) A method of processing signals comprising:
Providing a first signal from a first position relative to an instrument which includes an unwanted signal;
Providing an alternate signal from a second position relative to said instrument which includes a lower proportion of said unwanted signal;
Supplying said first and alternate signals to first and second signal processors, respectively;
Adjusting a level for a selected frequency band of said first signal and said alternate signal with said respective first and second processors, where said selected frequency band is less than a full frequency spectrum of said first and alternate signals, such that an increase of level in one of said first and alternate signals results in a decrease in level in the other of said first and alternate signals; and
Combining said first and alternate signals after said adjusting step.
19. (Amended) An apparatus for modifying a signal comprising:
a first signal source generating a first signal including an unwanted signal;

an alternate signal source providing an alternate signal including a lower proportion of said unwanted signal; and

first and second signal processors adapted to receive said first and alternate signals, respectively, and adapted to adjust a level for a selected frequency band of said first signal and said alternate signal with said respective first and second processors, where said selected frequency band is less than a full frequency spectrum of said first and alternate signals, such that an increase of level in one of said first and alternate signals results in a decrease in level in the other of said first and alternate signals.

24. (Amended) An apparatus for processing signals comprising:

a first signal source adapted to provide a first signal from a first position relative to an instrument which includes an unwanted signal;

an alternate signal source adapted to provide an alternate signal from a second position relative to said instrument which includes a lower proportion of said unwanted signal; and

first and second signal processors adapted to receive said first and alternate signals, respectively, and adapted to adjust a level for a selected frequency band of said first signal and said alternate signal with said respective first and second processors, where said selected frequency band is less than a full frequency spectrum of said first and alternate signals, such that an increase of level in one of said first and alternate signals results in a decrease in level in the other of said first and alternate signals.